

Cells with surface expression of CD133(high)CD71(low) are enriched for tripotent colony-forming progenitor cells in the adult murine pancreas.

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Public Summary:

Progenitor cells in the adult pancreas are potential sources of endocrine beta cells for treating type 1 diabetes. Previously, we identified tri-potent progenitor cells in the adult (2-4month-old) murine pancreas that were capable of self-renewal and differentiation into duct, acinar, and endocrine cells in vitro. These progenitor cells were named pancreatic colony-forming units (PCFUs). However, because PCFUs are a minor population in the pancreas (~1%) they are difficult to study. To enrich PCFUs, strategies using cell-surface marker analyses and fluorescence-activated cell sorting were developed. We found that CD133(high)CD71(low) cells, but not other cell populations, enriched PCFUs by up to 30 fold compared to the unsorted cells. CD133(high)CD71(low) cells generated primary, secondary, and subsequent colonies when serially re-plated in Matrigel-containing cultures, suggesting self-renewal abilities. In the presence of a laminin hydrogel, CD133(high)CD71(low) cells gave rise to colonies that contained duct, acinar, and Insulin(+)Glucagon(+) double-hormonal endocrine cells. Colonies from the laminin hydrogel culture were implanted into diabetic mice, and five weeks later duct, acinar, and Insulin(+)Glucagon(-) cells were detected in the grafts, demonstrating tri-lineage differentiation potential of CD133(high)CD71(low) cells. These CD133(high)CD71(low) cells will enable future studies of putative adult pancreas stem cells in vivo.

Scientific Abstract:

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